SUBSTITUTE ATTACHMENT - CLAIMS LISTING

This listing of claims will replace all prior versions, and listings, of claims in the application.

1-76. (Canceled)

77. (Currently amended) A thermally compensating non-magnetic balance wheel for use in conjunction with a thermally stable non-magnetic balance spring in a mechanical oscillator system in a horological or other precision instrument, the balance wheel ~~including~~ comprising:

components of two different non-magnetic materials having different thermal expansion coefficients, the components being arranged to give equipoise to the balance wheel and to cause a decrease in the moment of inertia of the balance wheel with an increase in temperature, wherein the decrease in the moment of inertia is arranged to compensate for changes in the elasticity of the balance spring caused by the increase in temperature.

78. (Previously presented) A balance wheel according to claim 77, wherein the components include a balance wheel arm having one or more cross members and a rim attached to or integral with said cross members.

79. (Previously presented) A balance wheel according to claim 78, wherein the cross member(s) is of a first material having a first coefficient of thermal expansion and the rim comprises concave segments of a second material having a second coefficient of thermal expansion greater than said first coefficient of thermal expansion.

80. (Previously presented) A balance wheel according to claim 78, wherein the balance wheel rim and cross member(s) are formed of a first material having a first coefficient of thermal expansion and the balance wheel further comprises two concave

segments inside said rim, formed of a different material to said rim having a second coefficient of thermal expansion greater than said first coefficient of thermal expansion.

81. (Previously presented) A balance wheel according to claim 78, wherein the balance wheel rim is formed of a first material having a first coefficient of thermal expansion and two or more members formed of a second material having a second coefficient of thermal expansion greater than said first material are attached to said rim and extend inwardly therefrom.

82. (Previously presented) A balance wheel according to claim 78, wherein the cross member(s) is of a first material having a first coefficient of thermal expansion and the rim is of a second material having a second coefficient of thermal expansion less than the first coefficient of thermal expansion, such that the increase in temperature causes an increase in the cross member(s) length and radially inward deflection of the rim to cause the decrease in the moment of inertia of the balance wheel.

83. (Previously presented) A balance wheel according to claim 82, wherein there are at least two appendages to the rim in the form of non-magnetically sensitive timing weights.

84. (Previously presented) A balance wheel according to claim 82, wherein said second coefficient of thermal expansion is negative.

85. (Previously presented) A balance wheel according to claim 82, wherein said first coefficient of thermal expansion is less than $6x10^{-6}K^{-1}$.

86. (Previously presented) A balance wheel according to claim 82, wherein there are one or more appendages arranged on the cross member(s), said appendage(s) comprising a stem and an eccentric head on the stem, the stem being rotatably mounted in an aperture of the balance wheel such that it is rotatable about an axis

parallel to the axis of rotation of the balance wheel, whereby the moment of inertia of the balance wheel can be fine tuned by turning of the eccentric head.

87. (Previously presented) A balance wheel according to claim 79, wherein the second coefficient of thermal expansion is positive and greater than said first coefficient of thermal expansion, such that said concave segments are arranged to extend further radially inward with the increase in temperature to cause the decrease in the moment of inertia of the balance wheel.

88. (Previously presented) A balance wheel according to claim 87, wherein there are a plurality of appendages to the concave segments in the form of non-magnetically sensitive timing weights.

89. (Previously presented) A balance wheel according to claim 87, wherein said first coefficient of thermal expansion is negative, such that the cross member length(s) decreases with the increase in temperature to cause the decrease in the moment of inertia of the balance wheel.

90. (Currently amended) A balance wheel assembly comprising:

a thermally compensating non-magnetic balance wheel for use in conjunction with a thermally stable non-magnetic balance spring in a mechanical oscillator system in a horological or other precision instrument, the balance wheel including components of two different non-magnetic materials having different coefficients of thermal expansion, the components being arranged to give equipoise to the balance wheel and to cause a decrease in the moment of inertia of the balance wheel with an increase in temperature, wherein the decrease in the moment of inertia is arranged to compensate for changes in the elasticity of the balance spring caused by the increase in temperature; and

a balance staff formed integrally with the balance wheel.

91. (Previously presented) A balance wheel assembly according to claim 90, wherein the balance wheel and balance staff are formed of a ceramic material.

92. (Previously presented) A balance wheel assembly according to claim 90, wherein the balance staff is integrally formed with one or more cross members which are arranged to support the balance wheel rim.

93. (Currently amended - withdrawn) A method of forming a balance wheel assembly, the balance wheel assembly comprising:

a thermally compensating non-magnetic balance wheel for use in conjunction with a thermally stable non-magnetic balance spring in a mechanical oscillator system in a horological or other precision instrument, the balance wheel including components of two different non-magnetic materials having different materials having different coefficients of thermal expansion, the components being arranged to give equipoise to the balance wheel and to cause a decrease in the moment of inertia of the balance wheel with an increase in temperature, wherein the decrease in the moment of inertia is arranged to compensate for changes in the elasticity of the balance spring caused by the increase in temperature; and

a balance staff formed integrally with the balance wheel;

the method comprising attaching the balance staff and balance wheel together when they are in their green state and using a bonding or heat treatment process to secure them together.

94-97. (Canceled)